UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/850,059	05/08/2001	Jang Geun Oh	P-180	9167

34610 7590 04/14/2004

FLESHNER & KIM, LLP
P.O. BOX 221200
CHANTILLY, VA 20153

EXAMINER	
PATEL, NITIN C	

ART UNIT	PAPER NUMBER
2116	4

DATE MAILED: 04/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/850,059	OH ET AL.	
	Examiner	Art Unit	
	Nitin C. Patel	2116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 – 18 are presented for the examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maitra, US Patent 5,623,647, and further in view of Fung, US Patent 6,079,025.

4. As to claims 1 - 11, Maitra teaches system and method for operating a microprocessor which reduces power consumption by application specific clock throttling of CPU [140] by adjusting the CPU clock without user noticing any performance drop in his application with clock controlling unit [130] by asserting or de-asserting an internal cock divider mechanism in processor to throttle the internal CPU clock [150] based on computing requirement process for application with benchmark evaluator [col. 2, lines 40 – 59, col. 3, lines 1 – 16, col. 5, lines 31 – 37, fig. 1]. However, Maitra does not disclose CPU usage measuring, and comparing the measured CPU usage with predetermined reference CPU usage range. In summary, Maitra does not teach to measure CPU usage and compare it with predetermined reference CPU usage.

Fung teaches system and method for power management [15, power managementunit] in computer system by monitoring [by software [80] or hardware [79] monitor unit] activity of operating system [CPU usage] with activity measurement as a running total of the function call numbers as the function calls are made, comparing

magnitude of the number accumulated with a function call threshold, and determining to remain in active mode or to switch to power conservation mode by reducing clock speed or by removing clocks through clock control unit [18] [col. 2, lines 40 – 67, col. 3, lines 1 – 67, col. 5, lines 28 – 67, col. 6, lines 1 – 13, lines 30 – 46].

It would have been an obvious to one of an ordinary skill in art at the time of invention to combine teachings of Maitra and Fung because both are related to power conservation of computer system with CPU clock control and Fung's method of computer operating mode control with an activity sensing by comparing a function call numbers with threshold will improve power management and extend the battery life of portable computers without sacrificing system performance [col. 2, lines 33 – 38, lines 47 – 67, col. 3, lines 1 – 2].

5. As to claim 2, Fung discloses activity sensing by monitoring with measuring a function call numbers and comparing with a function call threshold therefore, he teaches how to store the function call threshold too [col. 3, lines 13 – 21].

6. As to claim 3, Fung discloses an activity [usage] monitoring by measuring a function call number, comparing with threshold, and determining operation mode switching of computer for power consumption reduction with different state [a DOZE state to SLEEP state to SUSPEND state] in step wise fashion [col. 3, lines 45 – 58].

7. As to claims 4 – 6, Maitra discloses CPU clock throttling with clock controlling unit by asserting and de-asserting an internal clock divider mechanism to adjust the processor to run at speed at full speed or at reduces speed to meet present active application's requirements without affecting the operation [col. 6, lines 18 – 47, col. 7, lines 4 – 53].

8. As to claim 7, Fung discloses a hardware monitoring [79] to measure an activity [CPU usage] with registers [detecting registry information][col. 7, lines 20 – 67, col. 10, lines 1 – 58, col. 12 - 15].

9. As to claim 8, Fung discloses a power management in computer system by monitoring a activity [CPU usage] by detecting how many "active" or "idle" a function calls an application makes within some time period [col. 3, lines 3 – 5].

10. As to claim 9, Fung discloses an activity [usage] monitoring by measuring [a function call number], comparing [with threshold], and adjusting [clock speed through clock control unit] steps [different state [a DOZE state to SLEEP state to SUSPEND state] are repeated in order at predertermined interval of time [col. 3, lines 3 – 5, 45 – 58, fig. 4, 5 - 6].

11. As to claims 10 – 11, Fung discloses to set a predetermined reference CPU usage's [activity] range [active threshold is set with threshold number (128) greater than the idle threshold number (-256)][col. 11, lines 30 – 36].

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 12 – 18, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Shaffer et al. [hereinafter as Shaffer], US Patent 6,298,448.

14. As to claim 12, Shaffer discloses a computer system comprising:

a. user interface means [50, clock control module] for enabling clock throttle rate adjustment [for increasing or decreasing frequency of clock] based on CPU usage [level of CPU usage] [col. 4, lines 52 – 54];

b. power management means [OS 32] for controlling a CPU's clock throttle rate [frequency of clock] [col. 4, lines 52 – 53]; and

c. device driver [device driver is inherent to OS] for reading CPU usage and controlling said power management [operating system (OS) 32][col. 3, lines 12 – 19, col. 4, lines 51 – 59, col. 5, lines 1 – 21].

15. As to claims 13, and 18, Shaffer discloses an apparatus and method for automatic CPU speed control in response to a CPU utilization application with dynamically monitoring level of CPU usage by power management means [operating system (OS) 32] with interrupt handle with built in number indicating its performance requirement therefore he teaches to detect the registry information too [col. 3, lines 36 – 46, col. 5, lines 5 – 38].

16. As to claim 14, it is inherent to the device driver to have seven types of different layers.

17. As to claim 15 Shaffer discloses a system and method for automatic CPU speed control comprising:

a. a first routine [CPU monitoring program] that measures a usage [utilization]of the CPU [col. 4, lines 54 - 56];

b. a second routine [OS 32] for comparing [comparing is inherent step for generating an interrupt when a predetermined threshold exceeded] the measured

CPU usage [utilization] with a predetermined CPU usage range [predetermined threshold][col. 5, lines 9 – 11]; and

c. a third routine [OS 32] for adjusting [increasing or decreasing] the clock throttle rate [clock speed] of the CPU [col. 5, lines 5 - 8].

18. As to claim 16, Shaffer discloses OS 32 use to control the frequency of clock in response to CPU utilization values provided by CPU monitor, and predetermined threshold with different situations for reducing, increasing or maintaining the clock frequency [col. 4, lines 51 – 67, col. 5, lines 1 – 30].

19. As to claim 17, Shaffer discloses a routine to repeat the first and third routine [processing performance calculation] at predetermined interval of time [every five microseconds] [col. 48 – 51].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin C. Patel whose telephone number is 703-305-3994. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on 703-305-9717. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nitin C. Patel
April 5, 2004

THOMAS LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100